in a north-north-west direction and in a depth of eight fathoms of water. This remarkable result has since been exceeded by observations made in H.M. surveying-vessel *Penguin* on November 6, 1890.

On this occasion, the *Penguin*, being 2 miles N. 79° E. from Bezout Island, a deflection of 22° was observed in her compass. The ship was immediately anchored, and some hours of the next day were spent in drifting backwards and forwards near that position, and the following results were obtained.

On Bezout Island the absolute values of the variation and dip were normal, the dip being 50° 1'·7 S. But at a position N. 79½° E., distant 2·14 miles from that on Bezout Island, the observed dip on board was 83° S., with a very small deflection of the compass. This may be considered the central point of the disturbing force. At 900 feet to the westward of this the dip was normal, and it decreased rapidly as the centre was quitted in any direction. At about 100 feet south of the centre of disturbance, the compass was deflected 55°. This was the largest deflection observed, but the compass was disturbed over an area of about a square mile. The general depth of water in this area was nine fathoms, and the quality of the bottom quartz sand.

The observations of the magnetic elements at Cossack and the neighbourhood showed little or no disturbance from local magnetic effects. It is therefore evident from the remarkable results now related, which have been derived from observations of undoubted accuracy, that the deflections of the compass in the *Meda* and *Penguin* were due to magnetic minerals at the bottom of the sea adjacent to the ship.

All well-authenticated observations point to a similar source, when deflections of the compass are caused by local magnetic forces external to a ship navigating near a coast. E. W. CREAK.

NOTES.

A GENERAL meeting of the International Congress of Hygiene and Demography was held on Monday. The Prince of Wales, who presided, announced that the Queen had consented to act as patron of the Congress. In the report of the Organizing Committee, which was read by Sir Douglas Galton, it was stated that the opening meeting would take place at St. James's Hall on August 10, under the presidency of the Prince of Wales, and the sectional meetings would be held on the five following days in the rooms of the learned Societies at Burlington House. A special committee had been formed to call attention to the Congress in India, and special representations and invitations had been forwarded to foreign Governments (through the Foreign Office), the colonies (through the Agents General), and also to county, municipal, and local councils throughout the country. The Corporation of London had voted £2000 for an entertainment to the Congress, to be given in the Guildhall, and there could be no doubt that much hospitality would be offered to the Congress during its session. The organization of the Congress involved a very large expenditure, first for making the Congress known throughout the world and making the necessary arrangements for its sections, and secondly for the publication of the transactions. It was estimated that between £5000 and £6000 would be necessary, and for this sum an appeal would be made. Sir Spencer Wells read a report from the Reception Committee, Dr. Corfield a report from the Foreign Committee, and Mr. Digby a report from the Indian Committee. It appeared that the Governments of France, Italy, and Switzerland, and several of the colonies, had already accepted invitations to send delegates to the Congress. The reply of the Indian Government had not yet been received, but Lord Cross was fully alive to the importance of India being represented at the gathering. In replying to a vote of thanks for presiding, the Prince of Wales said he had little doubt the seventh Congress would be even more useful than any of its predecessors.

MR. EDWARD BARTLETT, lately Curator of the Maidstone Museum (son of Mr. A. D. Bartlett, Superintendent of the Zoological Society's Gardens), has been appointed by Rajah Brooke to be Curator of the new Museum at Sarawak. Mr. Bartlett will shortly leave England for Sarawak to take up his new duties. The series to be placed in the Museum at Sarawak will be entirely confined to Borneo objects, which Mr. Bartlett will make every exertion to render as complete as possible. He will have the assistance of some excellent native collectors, by whose aid he hopes to make many discoveries in the still imperfectly known fauna of Borneo.

WE regret to have to record the death of Captain Daniel Pender, R.N., Assistant Hydrographer to the Admiralty. He died on the 12th inst., at the age of 58. Captain Pender had a remarkably extensive knowledge of the Pacific, where he served on various ships for a good many years.

DR. J. ERIC ERICHSEN was one of the speakers at the meeting held at the Mansion House on February 23, for raising a fund in aid of the extension of University and King's Colleges. His speech has now been printed separately, and ought to do excellent service to the movement on behalf of which it was delivered. Dr. Erichsen has much to say as to the good work accomplished by both institutions, and pleads eloquently for the support needed to enable them to comply adequately with the intellectual conditions of the present age.

THE Council of the Society of Arts will consider, early in May next, the award of the Albert Medal, and invite members of the Society to forward to the Secretary, on or before April 18, the names of such men of high distinction as they may think worthy of the honour. The medal was struck to reward "distinguished merit for promoting arts, manufactures, or commerce."

THE Shaen Memorial Wing of the Bedford College for Ladies (York Place, Baker Street), with the new science lecture-rooms and laboratories, to which we have already referred, will be formally opened by the Empress Frederick on Tuesday, March 24, at 4 p.m.

THE second International Ornithological Congress is to be held in Budapest at Whitsuntide. The opening ceremony and exhibition is on Sunday, May 17, and the concluding session on May 20, after which various excursions, beginning on the 21st, will be made. It is intended to divide the Congress into seven Sections, viz.: (1) Systematy; (2) Biology; (3) Anatomy; (4) Avigeography; (5) Oology; (6) Migration; (7) Economical Ornithology. The President of the General Committee is Count Bethlen, the Minister of Agriculture, and the President of the Scientific Committee, Dr. Otto Herman. The official head-quarters will be the National Museum, Budapest.

AN Electrical Exhibition was opened by the Lord Mayor on Monday in the St. Pancras Vestry Hall. The electric light is to be supplied to the parish by the Vestry, and the object of the present exhibition is to familiarize the inhabitants with the various conditions of electric illumination.

AMONG the deaths registered in the Zoological Society's Gardens last week, was that of a European Crane (*Grus cinerea*), which was acquired by purchase on May 13, 1848, and had thus lived nearly forty-three years in the Gardens. This is not quite so good a case as that of the Black Parrot (*Coracopsis vasa*), which died in 1884, after having lived fifty-four years in the Regent's Park.

The Geologists' Association has made arrangements for an excursion to the Isle of Wight at Easter. Head-quarters for the first two days will be at the Totland Bay Hotel, and for the remainder of the excursion at the Blackgang Hotel.

The National Congress of French Geographical Societies will hold its twelfth session this year at Rochefort.

The Société Botanique de France has decided to hold an extraordinary meeting at Collioure, a small town in the Pyrénées Orientales Department, from May 16 to 24. Many excursions will be made. The region is interesting to botanists, and has been rather neglected.

In the *Kew Bulletin* for March there is a valuable list of the orchids which flowered at Kew in 1890. It enumerates 766 species and varieties, and is published to afford data as to the time and duration of the flowering period of orchids cultivated in England. In the Kew collection no attempt is made, by the cultivation of a large number of examples, to give prominence to the most showy-flowered. On the other hand, as the *Bulletin* explains, every effort is made to obtain and cultivate even small and unattractive kinds of scientific interest, such as the ordinary collector would consider beneath his notice. In the limited space available for orchids as comprehensive a collection of species as possible is aimed at. Consequently, whilst there is never a great display of orchid flowers at Kew, at no time of the year is the collection wanting in flower interest. Thus, whilst the highest number of species flowered in any one month was 125 in May, the lowest was 85 in January. The average for each month was a fraction over one hundred. In 1811 the number of species in cultivation at Kew was only 37. There are now 1342 species, comprised in 158 genera. These figures do not include 174 varieties, and over 100 undetermined plants. The collection is kept up by means of exchange, and a small outlay, about £20 annually, for plants which can be obtained only by purchase.

The same number of the *Kew Bulletin* contains an official correspondence on the experimental cultivation of Egyptian cotton on the Gold Coast, and a note on "Dammar from New Caledonia."

In the second of the Cantor Lectures on Photographic Chemistry, delivered on Monday, the 16th, at the Society of Arts, Prof. Meldola called attention to the importance of the principle of associating other substances with the compound undergoing photo-chemical decomposition so as to increase the sensitiveness of the latter. As an illustration of this principle the lecturer alluded to a discovery which has recently been made, and which was practically demonstrated by the discoverer, Mr. F. H. Varley, at the conclusion of the lecture. By associating iron salts with suitable sensitizers, it has been found possible to prepare films quite as sensitive as any of the modern gelatine emulsions, and containing no trace of any silver compound. The advantage of such films, from an economical point of view, is obviously very great, and a new departure in the applications of photography to scientific and other purposes is likely to originate with the exaltation of the sensitiveness of iron salts.

At the meeting of the Academy of Natural Sciences, Philadelphia, on January 27, Prof. Heilprin exhibited a specimen of *Porites astræoides* from the Caletta Reef, harbour of Vera Cruz, Mexico, which gave some interesting data regarding the rate of growth of coral structures. The specimen in question was received through Captain J. Powell, Chief of Construction of Piers of the Mexican Railway, and is said by that gentleman to have been removed from an anchor which was cast in the autumn of 1885 and drawn in November 1890. The extreme period of growth is thus somewhat over five years, but naturally it is impossible to state how soon after the casting of the anchor attachment of the polyp was made. The coral is a mammillated sheet or crust measuring four inches in longest diameter, and somewhat less than three inches on the shorter diameter. The general thickness of the basal mass is not over $\frac{1}{5}$–$\frac{1}{4}$ inch, although through involution and secondary crustage knobs of considerable prominence have been added to the surface. Assuming the basal growth as the index of actual development, then the annual accretion would be (if we allow full five years for the process) scarcely $\frac{1}{20}$ of an inch. Observations recently made on other species of corals have yielded somewhat similar results.

M. Amédeé Berthoule has published a useful little work on the lakes of Auvergne. The subject is considered especially from the pisciculturist's point of view, but some very good photographs of scenery are given, and the author touches on various geological topics.

At Mont-Dol, in Brittany, already well known to geologists and palæontologists, the remains of about a hundred elephants have been discovered, gathered on a small surface of about 1900 square metres. All the bones are broken, and it is thought that the animals must have been eaten by prehistoric men.

The French Society of Physiological Psychology has appointed a Committee to investigate cases in which persons suppose themselves to have seen or heard some one who was not really present. M. Sully Prudhomme, member of the Academy of Sciences, will act as President.

The Quarterly Reports of the Palestine Exploration Fund contain monthly meteorological observations taken at Sarona, Syria, beginning with July 1888, the results of which are deduced by Mr. James Glaisher. The statement for January last contains a comparison of the atmospheric pressure in Palestine and in England for the ten years ending 1889. Mr. Glaisher shows that the mean monthly readings at Sarona are highest in the winter months, but very seldom so high as 30 inches; the lowes are in the summer months, but none so low as 29·6 inches, so that the mean monthly atmospheric pressure is very uniform. The highest absolute reading was 30·285 inches, and the lowest 29·442. Both these readings have occurred several times in the month of January.

The injury from hail in Würtemberg during the sixty years 1828-87 has been recently investigated by Herr Bühler (*Met Zeits.*). The yearly average of days with hail is 13, and about 0·92 per cent. of the cultivated land was affected, damage being done to the extent of about £120,000. July had most hail (34 days), June coming next (with 30·1 days). There is no evidence of increase of hail in the course of decades. The Black Forest district seems to have specially suffered. The author makes out 17 paths of the hailstorms. One very often frequented is that on the Danube, from Scheer to Ulm (70 km. long and 15 broad). All the paths seem connected with the configuration of the ground, and limited in many cases by quite low heights. Slopes with a western exposure are more in danger than those with an eastern; and plains suffer much less than hilly ground The frequently affirmed influence of forest on hail-fall is not distinctly proved by the Würtemberg data. Herr Hellmann has made a further study of the figures, and finds that in Würtemberg, as in the Rhone Department and in Carinthia, the chief maximum falls in the second half of July. A secondary one, nearly as high, occurs in June 20–24; this holds also for Carinthia, while in the Rhone Department this maximum is earlier, in the first half of June.

There seems to be some room for improvement in the methods adopted at the institutes which teachers in Indiana are compelled to attend. This year, the study at these establishments is botany, and the work is laid out for each month. According to the *American Naturalist*, the teachers will have to study the dog-tooth violet in November; in December they will be searching their gardens for flowering tulips, and scanning the orchards for the blossoms of the apple and peach; and in January the flower and fruit of the strawberry will form the subjects of discussion.

The Government of New Caledonia proposes to establish a Museum at Noumea, and has appealed for support to members of the Civil Service, native chiefs, persons who are known to occupy themselves with scientific inquiries, and colonists generally. It is hoped that the authorities may be able to form important collections, not only of natural products, but of objects interesting to anthropologists.

Messrs. Macmillan and Co. are issuing a new and thoroughly revised edition of "A Treatise on Chemistry," by Sir H. E. Roscoe and C. Schorlemmer. In the part recently issued (Part III. of Vol. III.) the authors deal with the chemistry of the hydrocarbons and their derivatives. The whole of the subject-matter has been revised, but they draw attention especially to the renewed discussion of the constitution of benzene, and to the researches of Nietzki and his co-workers on the higher substitution-products of benzene, which have explained the constitution of the remarkable substances derived from the explosive compound of potassium and carbonic oxide.

A new edition of the "Year-book of New South Wales" has been issued. It contains much well-arranged information as to the history and resources of that colony.

Messrs. George Bell and Sons have published "The School Calendar, and Hand-book of Examinations and Open Scholarships, 1891." This is the fifth year of issue, and the present volume will certainly not be less welcome than its predecessors. In a preface Mr. F. Storr sums up the educational events of 1890.

Mr. L. Upcott Gill has published an excellent "Book of Aquaria," which will be most welcome to many students of the ways of aquatic creatures. It consists of two parts, one dealing with fresh-water aquaria, by the Rev. G. C. Bateman, the other with marine aquaria, by Reginald A. R. Bennett.

Messrs. D. C. Heath and Co., of Boston, are publishing a series of "Guides for Science-Teaching." We have received the eighth volume, which treats of "Insecta." It is by A. Hyatt and J. M. Arms, and contains a series of replies to questions which have arisen in the minds of the authors while teaching.

We learn from the *Journal of Botany* that the series of British plants exhibited in the Botanical Gallery of the Natural History Museum has recently been extended by the addition of a series of British mosses, consisting of 576 species arranged in 129 genera. The arrangement is that adopted by Hobkirk in the second edition of his "Synopsis," and the descriptions have been taken from that work. The Museum has also acquired the extensive herbarium of the late M. Triana, containing upwards of 8000 plants, as well as a large collection from the province of Atacama, Chili, made by MM. Borchers and Philippi.

The same journal informs us that, at the request of the Irish Land Commissioners, Mr. W. Carruthers, F.R.S., is preparing a plain account of the potato disease, with illustrations drawn by Mr. W. G. Smith, which will be reproduced in chromolithography as a wall-diagram for schools and farm-houses. A reproduction of Bauer's water-colour drawings of the germination of wheat, in the form of six wall-diagrams for educational purposes, is also being prepared, under the direction of Mr. Carruthers, for publication by the Royal Agricultural Society, at a sufficiently low price to bring them within the reach of the poorest schools.

Silicon bromoform, $SiHBr_3$, has been obtained in the pure state by M. Besson, and an account of its mode of preparation and more important properties is given by him in the current number of the *Comptes rendus*. It is well known that hydrobromic acid exerts an action upon crystalline silicon of a somewhat similar nature to the action of hydrochloric acid, which forms a mixture of silicon chloroform and tetrachloride; but hitherto, M. Besson states, the products obtained have never been separated. Buff and Wöhler, the discoverers of silicon chloroform, $SiHCl_3$, long ago obtained a colourless fuming liquid by the action of hydrobromic acid upon silicon, resembling the corresponding chloroform in properties, but which was certainly contaminated with other products, especially silicon tetrabromide. M. Besson has isolated the compound by repeated fractional distillation of the product obtained by passing a stream of dry hydrobromic acid gas over crystals of silicon heated to a temperature just below redness. The main bulk of the liquid product consisted of silicon tetrabromide, boiling at 153°, but 5 per cent. distilled constantly at about 110°, and gave numbers, on analysis, closely agreeing with the formula $SiHBr_3$. Pure silicon bromoform is a colourless liquid, most difficult to work with. In the first place, it fumes exceedingly strongly at the first contact with air, and in a few minutes spontaneously inflames. Again, the vapour forms highly explosive mixtures with air which occasionally suddenly detonate with great violence. It is only possible, of course, to distil it in an atmosphere of an inert gas, when it boils at 110°. It still remains liquid at temperatures as low as −60°. Water at once decomposes it, and with solutions of alkalies the decomposition is very violent. Strong potash liberates twice as much hydrogen as is contained in the compound, the reaction proceeding as follows:—

$$SiHBr_3 + 5KOH = K_2SiO_3 + 3KBr + 2H_2O + H_2.$$

Dry ammonia gas also reacts in a very lively manner with silicon bromoform, and if the reaction is not moderated it is accompanied by incandescence. The white product appears to consist of a definite compound mixed with more or less of its products of decomposition. Phosphoretted hydrogen is without action under ordinary circumstances, but when compressed to 25 atmospheres in a Cailletet apparatus in contact with a few drops of silicon bromoform at the ordinary temperature, a white solid body is formed, which persists for some time after the pressure is removed, and which loses phosphoretted hydrogen in a stream of carbon dioxide. Silicon chloroform, when in contact with compressed PH_3 under like circumstances, forms an analogous substance in definite isolated crystals, which rapidly grow as long as the pressure is maintained.

The additions to the Zoological Society's Gardens during the past week include a Passerine Parrakeet (*Psittacula passerina*) from South America, presented by Miss Edith B. Burrell; a Markhoor (*Capra megaceros* ♂) from North-East India; a Bennett's Wallaby (*Halmaturus bennetti* ♀) from Tasmania; an Indian White Crane (*Grus leucogeranos*) from India, deposited; a Striped Hyæna (*Hyæna striata* ♂) from North Africa; a Maguari Stork (*Dissura maguari*); a Brazilian Teal (*Querquedula brasiliensis* ♂) from South America, purchased; an Indian Muntjac (*Cervulus muntjac* ♀), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

The "Capture Theory" of Comets.—A memoir by M. O. Callandreau, on the capture theory of periodic comets, has recently been published (*Annales de l'Observatoire de Paris*, vol. xx.). It is generally known that the periodic comets are distributed in groups which depend in some manner on the major planets. Jupiter's family of comets is at least fifteen in number, and all the members of it have direct motion, orbits only slightly inclined to the orbit of Jupiter, and aphelion points near